PN7000X User Manual

2014/01/10

PN7000X user and developper manual

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Document revision

Date	Version	Auteur	Description
09/01/2014	1.0	A. MONMARCHE	Document creation

1. Product Descriptions:

- Windows Embedded Compact 7, Android 2.3 and Linux 2.6 are three available operating systems for this device;
- WIFI, Ethernet port and 3G high speed internet surfing;
- Built-in high sensitivity U-Blox GPS module and active GPS antenna;
- Built-in CSR 4.0 Bluetooth module, longer transfer distance and stronger signal;
- Optional RS485 and RS422 ports;
- Three RS232 ports;
- CAN Bus support Version 2.0 B (ISO11898);
- External GPIO control interface;
- Optional G-sensor;
- 7-inch TFT LED backlight 16:9 800x480 display;
- Keys and touch control;
- Both USB device and USB Host functions;
- Support 32GB SDHC storage;
- Double channel earphone jack, built-in 1.5W left and right channel speakers, with microphone input;
- Compliant IP65 protection rate;
- Support RAM, On-DASH, and VESA mounting modes;

1.1.Product detailed specification

Basic Specs	
LCD	7''TFT LED Backlight Resolution: 800×480 Brightness: 400cd/m2
Touch panel	7-inch 4-wire resistive
Interfaces	SD card slot SIM card slot USB device USB Host×2 Earphone jack Microphone jack RS232×3(standard x 2, 1 optional) RS422/RS485 (choose one of them) CAN Bus (optional) Ethernet port GPIO (3 x DI, 1 x DO) DC IN
Keys	Panic/backlight +/Backlight -/Hone/Vol+/Vol-/Menu/Power
Start up mode	Pres power key (standard) or auto power on(optional)
Audio output	Stereo speakers, water proof 8-ohm 1.5W x 2
Power consumption	≤8W
WIFI module	802.11b/g/n (optional)

3G module	WCDMA or CDMA2000 (optional)
Bluetooth module	CSR chipset Ver. 4.0, dual modes data transfer (optional)
CAN Bus	Standard: Version 2.0 B (ISO11898) (optional)
GPS module	U-Blox 50 Channels high performance module (optional)
G-sensor	3-axis accelerometer(optional)
Dimension	230L×150W×42D(mm)
Weight	0.9Kg

System Specs	
CPU	Freescale i.MX535 （i.MX536）ARM Cortex-A8, 1GHz
Memory	DDR3 512MB
iNAND	4GB
Storage expansion	Support SDHC up to 32GB
Operating system	Windows Embedded Compact 7.0, Android 2.3 or Linux 2.6

Environment Specs	
Working temperature	-20□ to +65□
Storage temperature	-30□ to +80□
Working humidity	0% to 95%RH
Storage humidity	0% to 95%RH
IP ratings	Compliant IP65

1.2.Mechanical view

Figure 1 back

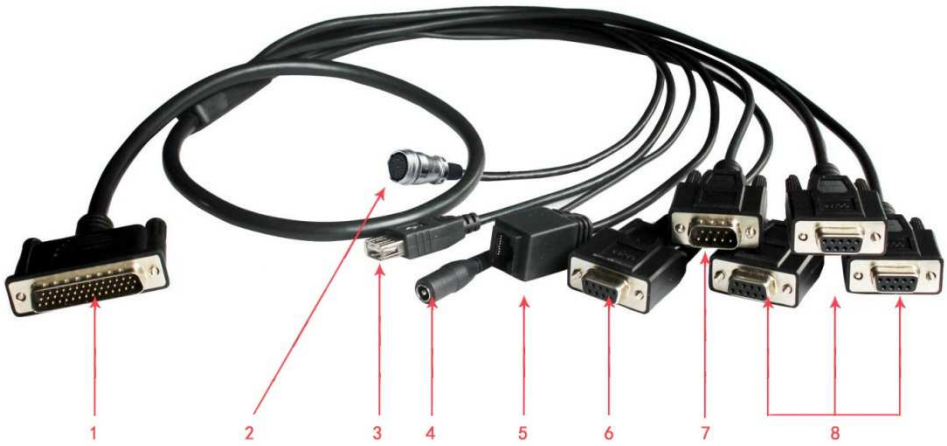
Figure 2 Front

Figure 3 Left

Figure 4 Right

1 44 pin male connector	**2** Panic	**3** Backlight brightness +	**4** Backlight brightness -
5 Home	**6** VOL +	**7** VOL -	**8** Menu
9 Power	**10** Speaker	**11** SD card/sim card slot cover	**12** Side cover claps
13 RAM mounting holes	**14** VESA mounting holes	**15** USB device connector	**16** USB host connector
17 Earphone jack	**18** Microphone jack	**19** Dash mounting hole	

1.3.Cable description



1 44 pin male connector	**2** GPIO connector (3*Dig IN, 1xDig Out)
3 USB host connector	**4** DC In
5 Ethernet port	**6** RS422/RS485 connector
7 CAN Bus connector	**8** 3* RS232 ports

2. Usage for Windows Embedded Compact 7 version

2.1. Touch panel calibration

- Double click My Device → double click Control Panel → double click Stylus
- Click Calibration option → click Recalibration button
- Click "＋" in the middle, click right top "＋", right bottom "＋", left bottom "＋", left top "＋", click any point and exit calibration.
- Click right top OK and finish the calibration

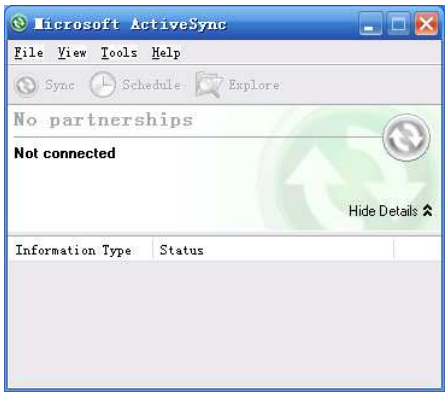
2.2. Key value (from left to right)

- Panic VK_F24
- Backlight－ VK_DOWN
- Backlight VK_UP
- Home VK_BACK
- VOL+ VK_LEFT
- VOL- VK_RIGHT
- Menu MENU
- Power hardware button, no key value

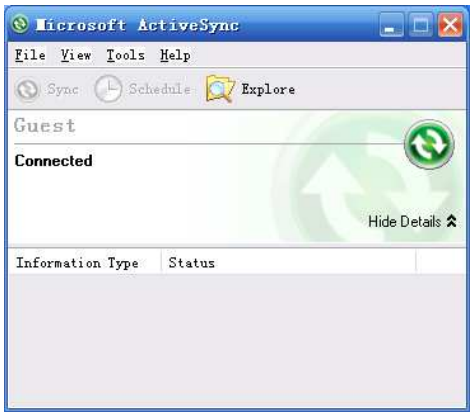
The icons on the keys can be customized according to customer's requirements.

2.3. USB device usage

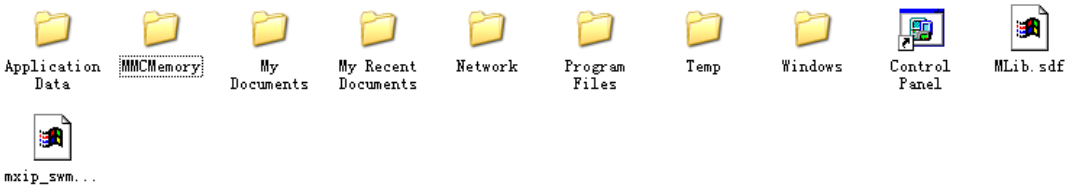
- Install Microsoft Active Sync 4.5.0 or above on the PC;
- The icon is as below if there is no connection;



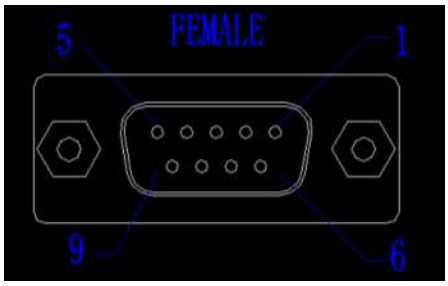
- Find a cable and its one end is Mini USB male and the other end is USB Host male. Mini USB male connector is connected with USB device on the PN7000X and the other connector is connected with USB Host on the PC;
- After successful connection, the icon is as below;



- Open “My Computer” and “Mobile Device ” to read the relative files on PN7000X (see following picture).



2.4.COM ports on pigtail cable



- COM1(RS232 DB9 male)-----Standard configuration is RS232. Debug port(hardware signal: Pin 2---TXD, Pin 3---RXD, Pin 5---GND) can be for service port;
- COM2(RS422/RS485 DB 9male)----------Standard is RS422(hardware signal: Pin 1---TX+, Pin 2---TX-, Pin 3---RX+, Pin 4---RX-, Pin 5---GND), optional is RS485(hardware signal: Pin 1---RX485+, Pin 2---RX485-, Pin 5---GND);
- 422 interface

```
[DllImport("Wrapper.dll")]

public static extern int Zed422();
```

set com2 422 mode .In this mode com2 is set 422 mode. COM2 can read and write.

- 485 interface

```
//485 422

[DllImport("Wrapper.dll")]
```

```
public static extern bool ZedInit();
```

this function can only load once.

```
[DllImport("Wrapper.dll")]
public static extern int Zed485RX();
```

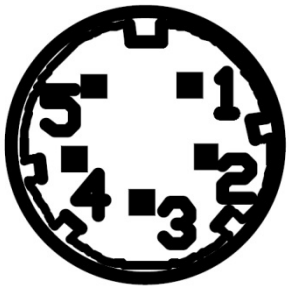
set com2 485 Rx mode.In this mode com2 can only read.

```
[DllImport("Wrapper.dll")]
public static extern int Zed485TX();
```

set com2 485 TX mode. In this mode com2 can only write.

- COM3 (RS232 DB9 male)-----Standard is service port(hardware signal: Pin 2---TXD, Pin 3---RXD, Pin 5---GND, Pin 6---5V, Pin 9---GND)；
- COM4(RS232 DB9 male)-----Standard is service port(hardware signal: Pin 2---TXD, Pin 3---RXD, Pin 5---GND);

2.5.GPIO on pigtail cable



- PIN1----------GND;
- PIN2----------DI1 voltage range(0～30V), under 5V is low level, above 8V is high level;
- PIN3----------DI2 voltage range(0～30V), under 5V is low level, above 8V is high level;
- PIN4----------DI3 voltage range(0～30V), under 5V is low level, above 8V is high level;
- PIN5----------DO voltage range(0～30V), under 5V is low level, above 8V is high level;
- 3 input interface

```
[DllImport("Wrapper.dll")]
public static extern int ReadInputGPIOStatus(int index);
```

int index: range 1,2,3

- 1 :DI1
- 2:DI2
- 3:DI3

Return:

- For DI1, DI2 return 0 means DI1, DI2 high level
- For DI1, DI2 return 1 means DI1, DI2 low level
- For DI3 return 0 means DI3 low level
- For DI3 return 1 means DI3 high level

- Set GPIO out

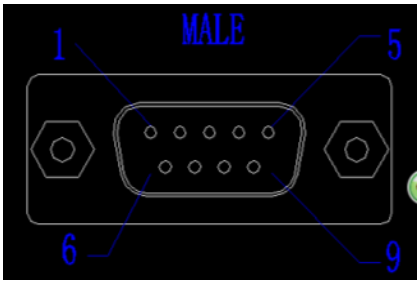
```
[DllImport("Wrapper.dll")]

public static extern int SetGpio(int high);
```

- high:

  0 to low

  1 to high

2.6.CAN Bus on pigtail cable



- CAN Bus DB9 male
- hardware signal:
  - Pin 3\Pin 6-----GND,
  - Pin 2---CAN-,
  - Pin 7---CAN+;

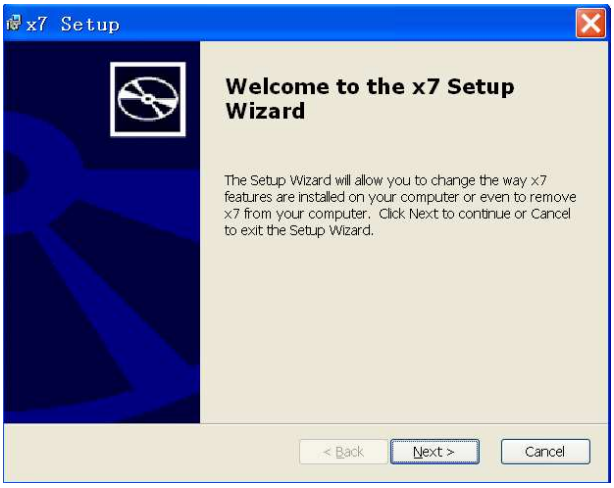
2.7.Windows Embedded Compact 7 SDK Installation Descriptions

Environment:

- 32bit operating system
- Microsoft Visual Studio 2008

Installation Steps:

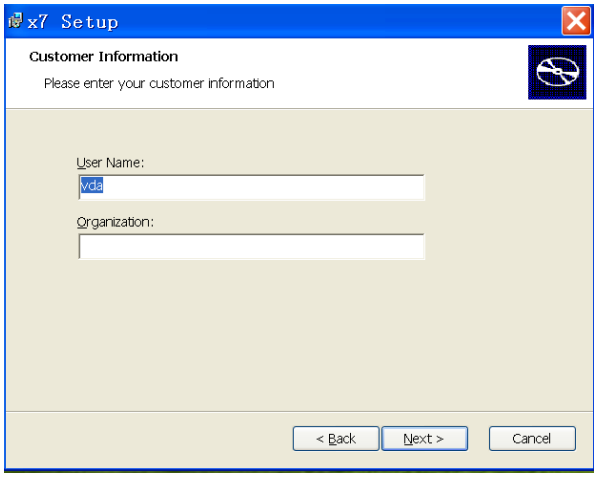
- Click on wince7.msi


x7 Setup
Welcome to the x7 Setup Wizard
The Setup Wizard will allow you to change the way x7 features are installed on your computer or even to remove x7 from your computer. Click Next to continue or Cancel to exit the Setup Wizard.
< Back
Next >
Cancel

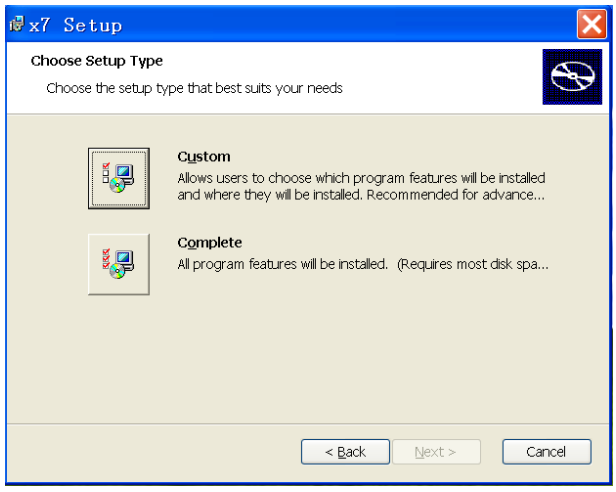
- Click on next

x7 License Agreement
End-User License Agreement
Be sure to carefully read and understand the following end-user license agreement, and then indicate whether you accept or do not accept the terms of the agreement.
This software will not be installed on your development workstation unless you accept the terms of the end-user license agreement. For your future reference, you can print the text of the end-user license agreement by clicking the PRINT button.
SOFTWARE LICENSE TERMS
MICROSOFT WINDOWS EMBEDDED COMPACT 7 OEM SOFTWARE DEVELOPMENT KIT for
x7, 0.0.1
These license terms are an agreement between [waysion] "Company" and you. Please read them. They apply to the software named above which includes software licensed by Microsoft Corporation or their affiliates ("Microsoft") to Company. The software also includes documentation and any media on which you received it. The terms also apply to
Press the PAGE DOWN key to see more text.
Accept
Decline
Print
< Back
Next >
Cancel

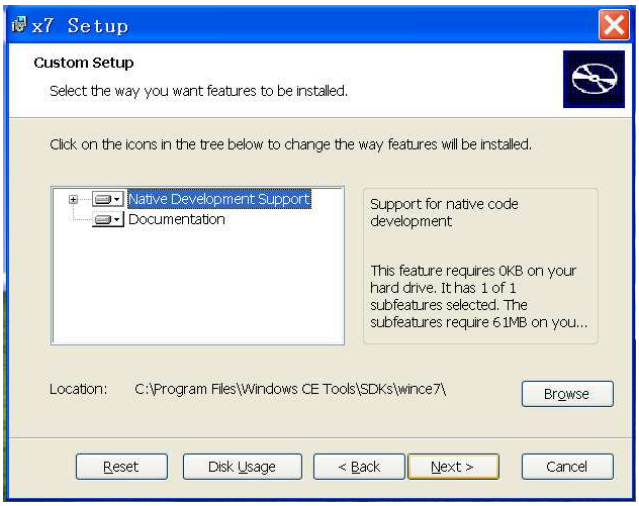
- Select Accept ,and Click on next



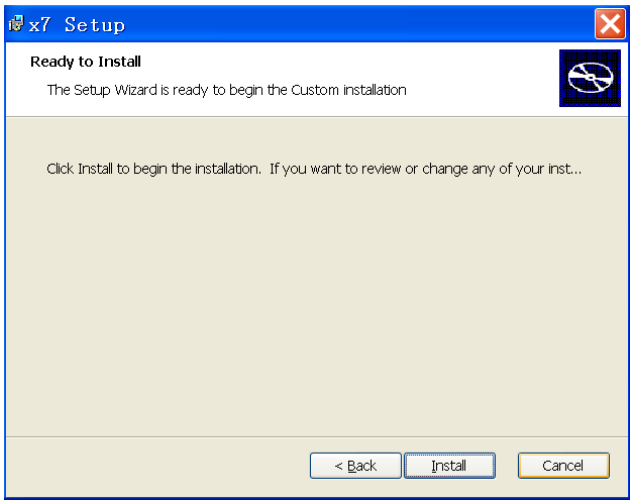
- Please enter User Name and Organization ,Click on next


x7 Setup
Choose Setup Type
Choose the setup type that best suits your needs
Custom
Allows users to choose which program features will be installed and where they will be installed. Recommended for advance...
Complete
All program features will be installed. (Requires most disk spa...
< Back
Next >
Cancel

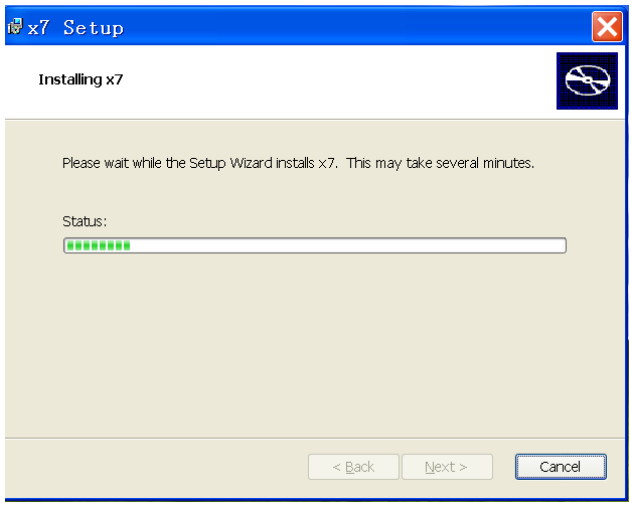
- Select Custom or Complete, Click on next


x7 Setup
Custom Setup
Select the way you want features to be installed.
Click on the icons in the tree below to change the way features will be installed.
Native Development Support
Documentation
Support for native code development
This feature requires 0KB on your hard drive. It has 1 of 1 subfeatures selected. The subfeatures require 61MB on you...
Location: C:\Program Files\Windows CE Tools\SDKs\wince7\
Browse
Reset
Disk Usage
< Back
Next >
Cancel

- Click on next


x7 Setup
Ready to Install
The Setup Wizard is ready to begin the Custom installation
Click Install to begin the installation. If you want to review or change any of your inst...
< Back
Install
Cancel

- Click on Install



- Click on Finish , Installation ok.

2.8.Operating system upgrade

- Prepare a SD card with capacity of 4GB or below. Format it to be FAT32;
- Put Upgrade.me, eboot.nb0 and xip.nb0 into SD card;
- Insert SD card to PN7000X's SD card slot and power on the device. The system will be upgraded automatically;
- When screen shows "Upgrade has been finished, reset unit", it means that the upgrade is finished; Unplug power and restart the device. It will go to WinCE desktop.

OS image files are not provided.

2.9. Logo upgrade

- Prepare a SD card with capacity of 4GB or below. Format it to be FAT32;
- Logo condition: bmp format, capacity can't be over 512KB, 24 bits, no compression, centrally located. Its name must be ebootlog.bmp;
- Put Upgrade.me, ebootlog.bmp into SD card;
- Insert SD card to SD card slot of PN7000X and power on the device. The device will upgrade the logo automatically;
- When screen shows "Upgrade has been finished, reset unit", it means that the upgrade is finished; Unplug power and restart the device. The boot-up logo will be on the screen.

2.10. backlight interface

```
[DllImport("Wrapper.dll")]

public static extern int UpdateBklSettings(BYTE level);
```

- level：0-255
  - 0：lowest light
  - 255: high light

2.11. get backlight interface

```
[DllImport("Wrapper.dll")]

public static extern int GetBklSettings ();
```

- return：0-255
  - 0：lowest light
  - 255: high light

2.12. shut down interface

Shut down the device.

```
[DllImport("Wrapper.dll")]

public static extern int ShutDown ();
```

2.13. open key led light

```
[DllImport("Wrapper.dll")]

public static extern int TurnOnKeyPadBackLight ();
```

2.14. close key led light

```
[DllImport("Wrapper.dll")]

public static extern int TurnOffKeyPadBackLight ();
```

2.15. Format the registry

- Press Panic key and Vol- key simultaneous, and press Power key to power on the device until the device is powered on;
- When the screens shows “Device registry has been cleared”, it means that the registry format is finished and it will go to WinCE desktop soon;

3. Usage for Android 2.3 version

3.1.Touch screen calibration

- Delete pan_ts file under ES File Explorer, reboot the device
- Double click Calibration Test, press “＋” to start the calibration
- Exit it once it is done

3.2.Key value (from left to right)

- Panic 158
- Backlight brightness＋ 103
- Backlight brightness - 108
- Home 102
- Vol+ 115
- Vol- 28
- Menu 139
- Power 116

3.3.USB device

- Go to http://www.360safe.com/ to down load software for PC terminal and install it
- Find a cable and its one end is Mini USB male and the other end is USB Host male. Mini USB male connector is connected with USB device on the PN7000X and the other connector is connected with USB Host on the PC;
- Then USB device can work

3.4.COM port on pigtail cable (hardware is same as WinCE’s)

- ttymxc0----debug port;
- ttymxc1----RS422/485;
- ttymxc2----RS232;
- ttymcx3----RS232;

3.5.GPIO on pigtail cable (hardware is same as WinCE’s)

- DI1 --> gpio195

- DI2 --> gpio177
- DI3 --> gpio178
- DO --> gpio192

Provide DEMO to customers for debug

3.6.CAN Bus

There is no CAN Bus for Android version

3.7.SDK installation

Download SDK package from http://developer.android.com/sdk/index.html

3.8.System upgrade

- Copy update.zip to SD card and insert SD card to PN7000X
- Press Vol-(No 6 button from left to right) and Power buttons at the same time. When penguin icon comes out on the right top of screen, release Power button. Release Vol- until Android logo comes out.
- Press Menu button to go to Recovery mode and select Apply Update From SD Card(from left to right, button No 2 and 3 are up and down. Button No 6 is confirmation key). Press Confirm to select right update.zip file. Upgrade bar will come out;

OS files are not provided.

4. Usage for Linux version

→Linux version is totally customized and customers have to provide detailed specs requirements. Hardware instructions are same as WinCE/Android version's.